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ABSTRACT

This paper describes and discusses a number of conceptual approaches and models for determining the cost-effectiveness of educational programs. Section 1 first discusses a number of conceptual models and designs related to cost-effectiveness analysis in education and then describes several specific cost-effectiveness models that have been recently developed and applied in education. Section 2 offers a detailed description of Project Turnkey, a three-year effort to implement a comprehensive cost-effectiveness model for use in connection with Michigan's compensatory education reading program. (JG)

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AASA PRESENTATION

COST-EFFECTIVE ANALYSIS IN EDUCATION

February 20-23, 1976

Presented By

Charles L. Blaschke
President

AND

John M. Sweeney
Treasurer

EDUCATION TURNKEY SYSTEMS, INC.

EA 008 115

DRAFT

AASA PRESENTATION

COST-EFFECTIVE ANALYSIS IN EDUCATION

INTRODUCTION

The purpose of this paper is to describe several conceptual as well as existing models which can be or have been used to determine the cost-effectiveness of education programs and then to summarize recent major findings in this area. We propose to rely rather heavily on our personal expericence in Michigan over the last four years and other projects in which we have been involved.

Cost-effectiveness is a very timely topic for discussion with a group of school superintendents and administrators for several reasons. First, Congress in the Education Amendments of 1974 mandated approximately $350 million of studys and surveys of w ich $50 million focused upon compensatory education. With few exceptions each of these studies had a component on cost-effectiveness. Most of these studies, scheduled for completion at the end of this year or the beginning of next year, will undoubtedly receive national attention in the media and specifically in the debates before Congress as it considers extension of ESEA in 1977. Therefore, knowledge about the various types of models and approaches in some of these studies will provide you with a better understanding of the results. Second, for an administrator in the typical school system in this country, cost-effectiveness as an issue is being forced to the surface by several factors: a) increased operational costs due to inflation and pressures to increase staff salaries, b) declining student enrollments at the elementary level which require even stronger justification for existing budgets, c) public demands for accountability and increased efficiency of governmental operations including school districts.

Before describing some of the specific models recently developed and applied it is important to understand several conceptual models and designs along some of the definitional issues which tend to confound and confuse the concept of cost-effectiveness analysis in education.

DEFINITIONAL ISSUES

Like many terms used in specialized fields, "cost-effectiveness analysis" can connotate different meanings to different people. Before attempting to define the term, it will be useful to discuss some directly-related predecessors and concepts.

Cost-benefit analysis is usually concerned with large "universes", with multitudes of components as the foci for analysis. State-or nation-wide governmental public services are more suitable subjects for cost-benefit analysis than would be a particular type of school operation. When used in the education context, cost-benefit analysis attempts to identify at least three general levels of benefits. Primary benefits are usually defined in terms of student performance, pupil attitudes, community involvement, and similar factors which are often difficult to quantify. Secondary benefits are usually associated with specific societal effects of educational policies. For example, a secondary benefit of reducing the student dropout rate is a decreased probability of unemployment and, hence, a lower expected welfare cost to society. Tertiary benefits are usually defined in a more global sense, such as the degree to which a high school graduate is a better citizen than a non-graduate. To illustrate, a recent study determined that the cost to society of a typical high school dropout is more than $20,000. An analysis such as this can put forth strong arguments for expending large sums of money in an attempt to reduce the number of dropouts.

Cost-achievement analysis is often specifically applied to programs which report results in terms of cost per some unit of achievement (e.g., cost per grade level gain). Such analyses are generally limited for decision-making purposes and can be extremely misleading, largely because the results apply only to specific projects operated under specific conditions with a specific target population. The utility of cost-achievement analysis in projecting the cost per unit of achievement for different configurations of the same instructional program applied at different locations and under varying conditions is extremely limited. Many of the recent studies concerned with this type of analysis have been preoccupied with analytical "percentomania" (e.g., determination of cost per minute of instruction, monthly achievement gains). Evaluation of many ~~recent~~ performance contracting projects have taken the form of cost-achievement analyses. While expensive instructional programs may be compared to less expensive ones to determine which program is delivering the most achievement per dollar, these analyses do not relate results to specific program variables.

Economic or cost analysis refers to an assessment of the resource or cost consumption patterns of an instructional operation, be it an individual class, a grade level, a school, or a district. The degree of sophistication of these cost analysis techniques ranges from simple accounting compilations of line items in a budget to computerized models of instructional resource consumption patterns. Thorough cost analysis techniques include the capability

to present an educational decision-maker with information of equal-cost instructional alternatives to existing programs by means of economic "trade-off and sensitivity" analysis (i.e., a cut in one budget area would allow how much of an increased allocation in another). Ironically, the aspect of economic analysis which some consider its greatest limitation may, in reality, be its greatest strength: it centers on only a portion of the problem, the cost aspects, and leaves effectiveness judgments to the educator. The user of this type of analysis devotes all his energies to developing a managerially useful definition and analysis of educational costs.

Effectiveness analysis is similar to some of the evaluations of educational delivery systems which continually appear in the education research community. Here, an attempt is made to determine which educational factors contribute most to educational performance. The determination of the degree of which a factor contributes as primarily a problem is establishing causality. In other words, effectiveness analysis attempts to determine which factors caused a change in educational performance. It should be noted that the determination of strict causality may not be practical in education today. Rather, causality is established within some degree of error.

Cost-effectiveness analysis combines the strong points of each of the analyses described above. Cost-effectiveness analysis techniques attempt to relate, within a cost framework, changes in inputs

to changes in outputs while attempting to control qualitative variables.

OTHER ISSUES

The first major issue is the measure of effectiveness. Most studies tend to use cognitive student gains measured on a pre-post test basis (usually in math and reading) as a primary measure of effectiveness. In a number of districts and states (e.g., Michigan and New York) studies have begun to use criterion or objective referenced tests in conjunction with standardized norm referenced tests. While each of these above approaches has its advantages and disadvantages, a limited number of studies including one in which we have participated have attempted to integrate the best aspects of both. For example, if one uses nationally normed standardized tests which have national norms or item difficulties for individual test items, then one can convert these items to specific performance objectives thereby attempting to ensure program fairness in evaluations. Such factors as coverage or content validity, relative importance of objectives, number of objectives, and other factors, can be used as well, resulting in an index associated with the relative effectiveness among programs.

Second, the reliability of data, particularly those obtained in process evaluations, has always been a concern. This factor is extremely critical in cost-effectiveness studies where the attempt is made to determine not only the total amount of resources used

but the specific functions to which these resources are allocated (planning, training, etc.). In a number of national studies observational techniques which are extremely costly, time consuming, confined to classroom bound activities and sometimes disruptive have been used. Our own experience with the use of structured interviews administered to various types of building and district staff(with overlapping questions to provide opportunities for verification of time useage patterns and then to further audit the findings through existing budgets and other documentation)has shown that observational techniques are not always required.

Third, a number of cost-effectiveness studies, particularly those conducted by USOE and other federal agencies, have attempted to determine the causal relationship between cost and effectiveness. Using sophisticated analytical techniques such as path analysis,commonality analysis these studies, in the vast majority of instances have resulted in confusing findings which might suggest a possible lack of discriminatory power of the techniques used. Given the present state of the art and the qualitative nature of the instructional process, we feel that models which indicate strong associations and relationships which may or may not be causal in nature are satisfactory. Such models are extremely useful in identifying variables associated with successful programs as well as the resources consumed by those variables. Limits of generalizeability should be made clear.

SPECIFIC MODELS

Over the last decade several specific cost benefit models have been developed for use in long range planning at the federal level. Abt Associates in 1968 developed a cost-effectiveness model for elementary and secondary education. However, the model was conceptual and was not applied except in a general sense. Professors Henry Levin and Samuel Bowles, two economists, conducted a similar cost benefit analysis of education in the early seventies for the Fleischman commission in New York state as well as for other groups. Most of these models have limited utility for immediate policy formulation and are of less utility for practicing administrators. Two sets of researchers during the early seventies developed and applied so-called "production function" or"input/output" models on statewide or districtwide basis. Building upon the earlier works of Bailey at Syracuse University during the fifties, Professor Herbert Kiesling applied such a model to compensatory education in California, attempting to determine what mix of resources produced the greatest achievement gains in reading scores.

More recently, Summers and Wolfe of the Federal Reserve Bank of Philadelphia applied a similar model to the Philadelphia schools, identifying the resources and various mixes which contributed to student gains at various grade levels. These types of models are useful in identifying mixes of resources associated with student performance but are often misleading in that the models may or may not be accurate or relevent"process"models for education programs.

Too often models such as those mentioned to this point rely upon existing line item budgets for their source of cost data which, as will be described later, is almost impossible to do in an accurate and reliable manner.

The cost or economic models applied in education which are increasingly being used in national as well as federal and state and local studies can be classified into two groups: a) PPBS systems, and b) models which assess the cost of specific programs. This latter group are represented by Haggart type models and by TURNKE Cost-Ed model.

Most of you are familiar with the plethora of PPBS models which have been proposed and sometimes applied in public school operations. In their most sophisticated form they can be used to provide the basis for production function or input/output analysis; however, in most instances they have been applied as a form of cost-achievement conceptual models.

The Haggart type models designed by Sue Haggart while at the Rand Corporation were developed initially for defense applications and have been modified through several generations for use in evaluating education programs. These particular models are very useful in identifying the specific startup and operational costs associated with a project and then the recurring startup and operational cost for expanding and replicating such programs. For the most part these models use standard pricing, i.e., an imputed value for a teacher with specific experience levels, rather than actual costs of inputs or resources. In this sense, these models mask some of the decision making rationale in considering tradeoffs at the local level in program planning. For instance, the choice of hiring aides or teachers might well depend upon the local teacher surplus which may differ widely from site to site. The Haggart type model is presently being used

in several large scale national studies sponsored by USOE. These include the ETS study of Title I reading programs to be released in the next few weeks and the six year study conducted by Systems Development Corporation to determine the sustaining effects of Title I. A limitation of the Haggart type model is that it does not have the capability of providing tradeoff and sensitivity analysis for decision makers at the local level and in this sense is static rather than dynamic.

The COST-ED Model was developed by TURNKEY in 1967 and has been applied in numerous projects since that time allowing refinements to be developed along the way. This model is unique in that it not only allows the identification of resources and how they are allocated to various functions or programs but it also allows tradeoff and sensitivity analyses to be conducted. To illustrate the flexibility of the model, the Prince William County schools in Virginia used it to simulate the potential cost savings in converting to a 45-15 year round school. This simulation not only identified the total cost savings of approximately 9.9% per pupil but also the specific 15 or 20 areas in which the savings would occur as indicated in this slide (Slide 1). The model was also used in analyzing performance contract vs. standard math and reading programs involved in the OEO performance contract experiment in the early seventies. Here, the model allowed the comparison of the various resource utilization patterns as described in this next slide (Slide 2). Most recently, the model has been used in the Michigan Cost-Effectiveness Study which will be discussed later. As Professor Charles Benson noted, while the COST-ED model is very useful as a budget simulator, it may be too sophisticated in its present form to be used in any large scale effort by districts. It has been modified and simplified for use in districts such as

SLIDE 1

PRINCE WILLIAM COUNTY

SUMMARY OF SECONDARY 45-15 COST SAVINGS

Dollars Per Pupil Annually

(Percent of Total Per-Pupil Traditional Term Annual Costs Shown in Parentheses)

STAFF:		
Instructional		
Teachers	$ 33.84 (3.0%)	
Aides	.80 (-%)	
Total Instructional		$ 34.64 (3.0%)
Support		
Counselors	$ 4.39 (0.4%)	
Librarians	1.63 (0.2%)	
Principal/Asst. Principals	9.19 (0.8%)	
Support (Clerical) Staff	5.75 (0.5%)	
Total Support		$ 20.96 (1.9%)
TOTAL STAFF -		$ 55.60 (4.9%)
FACILITY:		
School Building Areas		
Classrooms	$ 28.84 (2.5%)	
Gymnasium	9.88 (0.9%)	
Cafeteria	5.12 (0.5%)	
Library	2.49 (0.2%)	
Offices	1.53 (0.1%)	
Total School Building Areas		$ 47.86 (4.2%)
Furnishings and Equipment		
Classroom Furnishings	$ 4.75 (0.4%)	
Audiovisual Equipment	.29 (-%)	
Gymnasium Equipment	.23 (-%)	
Cafeteria Equipment	.16 (-%)	
Library Furnishings	.38 (0.1%)	
Office Furnishings	.19 (-%)	
Total Furnishings and Equipment -		$ 6.00 (0.5%)
TOTAL FACILITY -		$ 53.86 (4.7%)
TOTAL SAVINGS -		$109.46 (9.6%)

Cost Comparisons of Experimental Performance Contracts in Elementary Reading

RANK	SITE	ORGANIZATION	HOURS/DAY	TOTAL COST PER STUDENT-YEAR	PERCENTAGE OF INSTRUCTION-ONLY COST						
					Teacher %	Paraprofessional %	Total Staff %	Classroom %	Instructional Equipment %	Books and Audio-visual %	Other %
Control programs:											
1	Athens	District	1.100	$150.32	70.9	0	70.9	23.0	2.3	1.1	2.7
2	Las Vegas	District	.983	174.10	66.5	0	66.5	28.7	0.9	2.3	1.6
3	Jacksonville	District	1.083	176.53	66.9	0	66.9	26.7	1.0	0.9	4.5
4	Grand Rapids	District	1.050	186.57	64.4	11.6	76.0	17.7	1.9	2.8	1.6
5	Dallas	District	1.546	216.63	80.9	0	80.9	15.3	1.7	0.8	1.3
6	Rockland (Thomaston)	District	1.170	221.01	76.3	0	76.3	16.1	0.6	2.8	4.2
7	Seattle	District	1.000	252.35	77.7	0	77.7	12.1	1.0	3.8	5.4
8	Selmer	District	2.000	255.76	78.8	0	78.8	18.4	0.5	1.0	1.3
9	Hammond	District	1.700	274.15	73.8	0	73.8	23.6	0.9	0.7	1.0
10	Fresno	District	1.500	286.95	75.4	0	75.4	19.4	0.9	1.4	2.9
11	Taft (Sinton)	District	2.000	300.85	80.0	0	80.0	17.9	0.4	0.6	1.1
12	Portland	District	1.917	349.80	74.3	0	74.3	19.9	2.3	2.3	1.2
Experimental programs:											
1	Selmer	PLAN*	.750	$147.70	46.1	15.4	61.5	19.2	0.8	17.6	0.9
2	Dallas	QED*	1.000	186.47	53.0	19.0	72.0	13.3	5.3	6.1	3.3
3	Athens	PLAN*	.920	190.84	53.2	19.7	72.9	10.9	1.5	14.7	0
4	Fresno	WLC*	1.000	215.52	12.6	41.7	54.3	10.4	8.6	3.6	23.1
5	Seattle	S/G*	.694	215.79	52.2	9.5	61.7	8.4	4.1	23.1	2.5
6	Grand Rapids	Alpha*	1.156	217.29	51.5	15.0	66.5	20.3	0	11.9	1.3
7	Hammond	LF*	.750	252.04	0	59.6	59.6	7.0	2.3	24.9	6.2
8	Portland	S/G*	.917	263.01	66.4	0	66.4	13.2	5.5	13.3	1.6
9	Jacksonville	LF*	1.000	270.25	0	66.1	66.1	7.9	2.1	17.6	6.3
10	Taft	Alpha*	1.500	280.52	49.5	32.0	81.5	9.4	0	8.2	0.9

*PLAN, Plan Education Centers; QED, Quality Education Development; WLC, Westinghouse Learning Center; S/G, Singer/Graflex; Alpha, Alpha Systems; LF, Learning Foundations.

SLIDE 2

NOTES

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Taft, Texas and in the Texas Education Agency Title I reporting system.

Probably the greatest variation in models lies in the area of effectiveness components. Since the results of a number of studies which are considered critical by Congress and Federal officials will be released in the near future, a few comments regarding several of these models appear to be appropriate.

First, the regression type models used by Coleman and subsequent reanalysis by Jencks focuses upon school as well as nonschool (such as family) effects on student performance. If the policy issue being considered is the redistribution of income to remove poverty levels, then these models may be appropriate. However, if the focus is upon the impact which schools can make regardless of family background, then these models have very limited use. Many of the findings from the Coleman and subsequent studies using the Coleman data, in my opinion, are somewhat dishonest since these findings have been used to "demonstrate" that ESEA Title I has not succeeded when in fact data used in these studies were for programs operating prior to the passage and implementation of ESEA Title I.

Next, in developing an accountability system for New York City schools during the early seventies, ETS developed an evaluation model focusing upon individual buildings and utilizing criterion referenced and other tests as a basis of achievement. To the best of my knowledge, the extensive sums of money allocated to this project have not yet resulted in a model being implemented beyond the conceptual stage. The ETS model applied in the Title I reading study scheduled to be released shortly focused upon similar students receiving similar treatment as a unit of analysis. The term "similar treatment" could

encompass a number of students in a given classroom or a number of students across schools. The instruments used to assess effectiveness were developed by ETS specifically for compensatory education students. However, in applying the model non compensatory education students were included, thus creating some very-difficult-to-explain results.

The present large scale study of "sustaining effects" conducted by SDC represents a six year effort, presently in the design phase, attempting to identify variables associated with high performance and continual high performance of students. While the specifics of this study design are not available at the present time, it would appear that standardized tests will be used as the basis of measuring achievement and sophisticated attempts to determine causality will be initiated through use of statistical concepts such as commonality analysis.

While the ETS, SDC, and other studies mentioned above are very similar in nature, a study was conducted in 1973 in areas including New York State and Michigan by Klitgaard and Hall of Rand Corporation which was important, not so much for its findings, but rather for the approach taken. Rather than asking the question which many of the above studies have basically asked -- namely, "What makes the average school average?" -- through the use of randomly selected national samples, Klitgaard and Hall attempted to identify any characteristics uniquely associated with highly successful programs as opposed to those common to all programs regardless of their success. This so-called "outliers" approach has never been undertaken in a massive way at the national

level although there were some similar components in part of the ETS study. Three years ago our staff in conjunction with the Michigan Department of Education (MDE) staff started developing a design for a model based on the work of Klitgaard and Hall. The resulting model was applied to compansatory education focusing upon the charactistics which discriminated between high achieving and low acnieving programs.

At this time I would like to call upon my associate, Jack Sweeney, who has been TURNKEY's project director for this large scale cost-effectiveness study in Michigan over the last 3 years to describe very briefly the analytical model used and some of the findings of that particular study which have corroborated or supported findings from some of the other studies mentioned earlier.

My portion of this presentation will focus upon the application of one of the cost-effectiveness techniques just described to a particular area, that of compensatory education reading programs in Michigan. As this next slide (SLIDE 3) indicates, the purpose of the study whose results will be discussed was mainly to develop a cost-effectiveness model for use in Michigan education. Comp ed reading was chosen as the vehicle for this development rather than as a study end in itself; though any findings resulting from this developmental effort would certainly be considered for their implications for comp ed reading programs.

The model developed for this study effort has two components as indicated in this next slide (SLIDE 4) -- effectiveness analysis and cost analysis. The effectiveness side of the model draws heavily upon the outlier approach mentioned earlier for identifying programs to study and applies a number of analytical techniques to the data gathered from these programs in order to isolate these program factors found in successful programs and not in unsuccessful programs. Program as the unit of analysis for this study was defined as the comp ed reading activities of interest for an entire school building, i.e., the Title I reading activities in thatbuilding or the state-funded Chapter 3 reading activities in that building. The cost side of the model draws upon the COST-ED methodology also mentioned earlier.

To assist in understanding the program nature of the results that will be presented later, I will briefly describe this COST-ED methodology in more detail. This next slide (SLIDE 5) shows

SLIDE 3

PURPOSE OF STUDY

- DEVELOP MODEL
  - IDENTIFY CHARACTERISTICS
  - ALLOCATE COSTS
- APPLY MODEL TO COMP ED (READING)
  - 73-74 (PRELIMINARY)
  - 74-75 (CROSS-VALIDATION)

SLIDE 4

DEVELOPMENT OF MODEL DESIGN

- EFFECTIVENESS COMPONENT
  - CONTRAST OUTLIERS
  - DISCRIMINANT FUNCTION ANALYSIS CENTERED ON GROUPINGS OF DATA
  - INDIVIDUAL VARIABLE CONTRASTS
- COST ED MODEL

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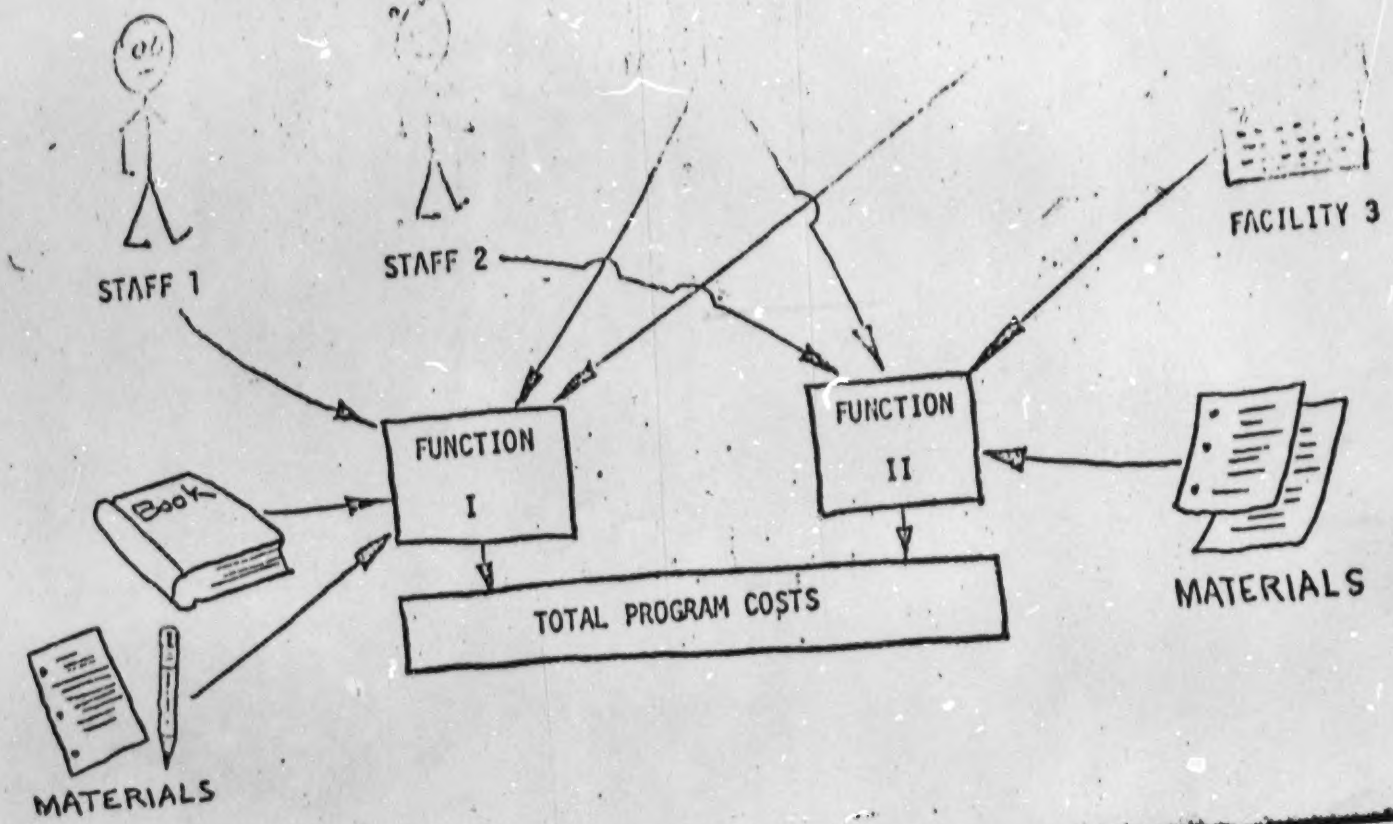
SLIDE 5

THE COST-ED™ Model



pictorially the programmatic orientation of COST-ED. Resources such as staff, facilities, and materials are shown as costs of specific activities or functions rather than simply as line items. The costs of the various functions which make up the program are then summed to form an estimate of the total program cost.

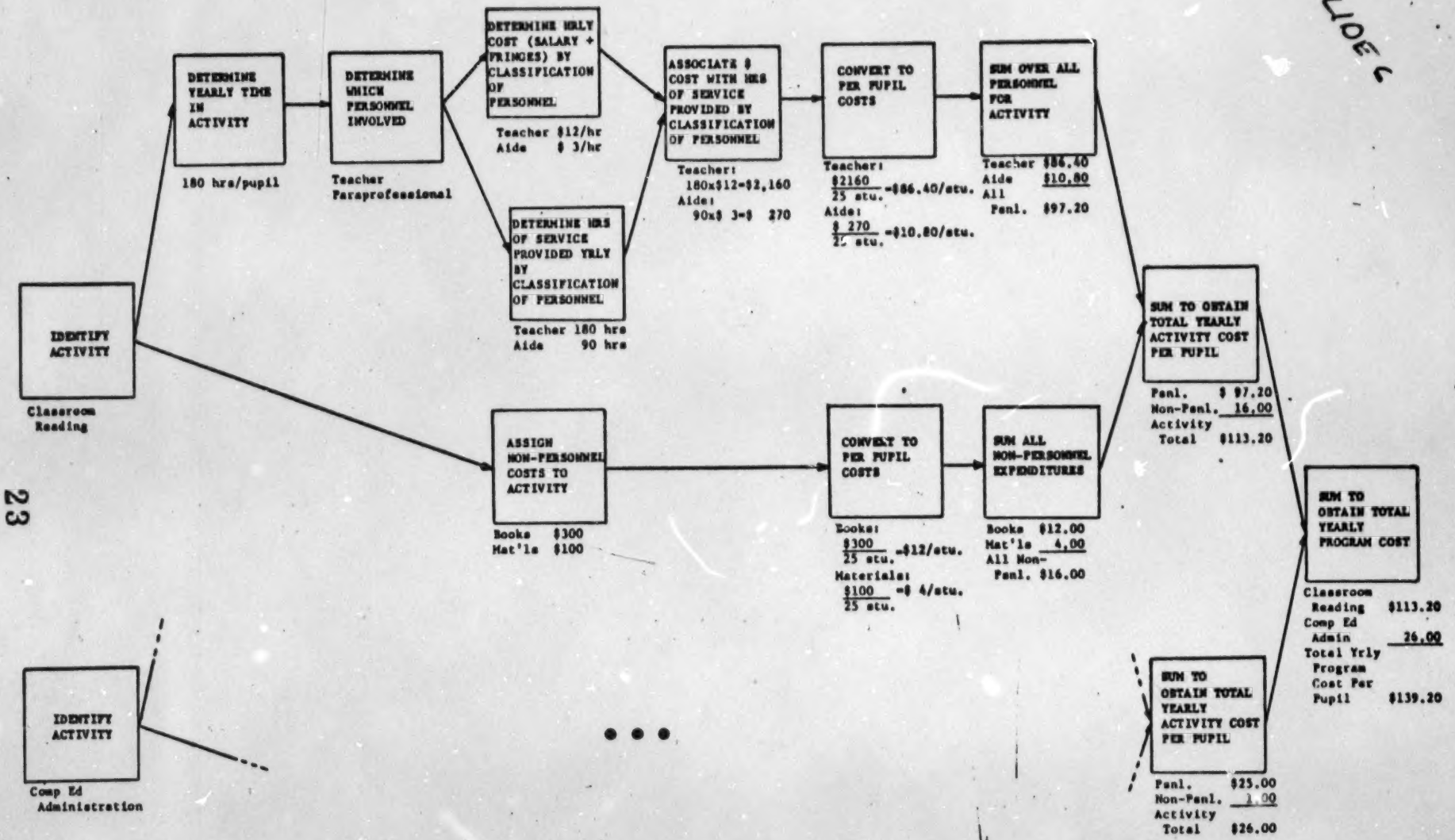
* This next slide (SLIDE 6) shows further details of the actual calculation stream used by COST-ED for in-classroom reading costs for a hypothetical comp ed reading program. The treatment of other functions such as administration is also indicated. The numbers shown are purely hypothetical, of course.

* This next slide (SLIDE 7) details the actual per pupil cost annually for one of the comp ed reading programs included in the 1973-74 study sample. The resources shown down the left side of this chart reflect line item entries but the functional subtotals indicated on the chart allow the total line item figures of the far right hand "Resource Total" column to be allocated to the specific functions which involve each resource. This particular program cost over $700 per pupil annually with $466 of this total consumed within the classroom in direct contact with students and the remainder consumed during necessary planning, training, decision-making, or administrative activities.

Keep in mind that the program cost results discussed later are based upon individual program analyses of this type and are not merely reflections of budget totals divided by some appropriate number of students. Also keep in mind that the cost figures shown in this slide (and later) include the cost of all resources

SUMMARY OF COST-ED METHODOLOGY

SUDE C


IDENTIFY ACTIVITY
Classroom Reading
DETERMINE YEARLY TIME IN ACTIVITY
180 hrs/pupil
DETERMINE WHICH PERSONNEL INVOLVED
Teacher
Paraprofessional
DETERMINE HRLY COST (SALARY + FRINGES) BY CLASSIFICATION OF PERSONNEL
Teacher $12/hr
Aide $ 3/hr
DETERMINE HRS OF SERVICE PROVIDED YRLY BY CLASSIFICATION OF PERSONNEL
Teacher 180 hrs
Aide 90 hrs
ASSOCIATE $ COST WITH HRS OF SERVICE PROVIDED BY CLASSIFICATION OF PERSONNEL
Teacher: 180x$12=$2,160
Aide: 90x$ 3=$ 270
CONVERT TO PER PUPIL COSTS
Teacher: $2160 / 25 stu. =$86.40/stu.
Aide: $ 270 / 25 stu. =$10.80/stu.
SUM OVER ALL PERSONNEL FOR ACTIVITY
Teacher $86.40
Aide $10.80
All Psnl. $97.20
ASSIGN NON-PERSONNEL COSTS TO ACTIVITY
Books $300
Mat'ls $100
CONVERT TO PER PUPIL COSTS
Books: $300 / 25 stu. =$12/stu.
Materials: $100 / 25 stu. =$ 4/stu.
SUM ALL NON-PERSONNEL EXPENDITURES
Books $12.00
Mat'ls 4.00
All Non-Psnl. $16.00
SUM TO OBTAIN TOTAL YEARLY ACTIVITY COST PER PUPIL
Psnl. $ 97.20
Non-Psnl. 16.00
Activity Total $113.20
IDENTIFY ACTIVITY
Comp Ed Administration
SUM TO OBTAIN TOTAL YEARLY ACTIVITY COST PER PUPIL
Psnl. $25.00
Non-Psnl. 1.00
Activity Total $26.00
SUM TO OBTAIN TOTAL YEARLY PROGRAM COST
Classroom Reading $113.20
Comp Ed Admin 26.00
Total Yrly Program Cost Per Pupil $139.20

SLIDE 7

XEROX Transparency Frame

Visual No. _____ Subject _____

DOLLARS PER COMP-ED STUDENT ANNUALLY

SITE 1107 RESOURCES	FUNCTIONS: COMP-ED READING	COMP-ED PLANNING	COMP-ED TRAINING	COMP-ED DECISION MAKING	COMP-ED ADMINISTRATION	RESOURCE TOTAL
PERSONNEL						
District Comp-Ed Director	--	--	--	--	--	--
Principal	--	37	--	--	--	37
Comp-Ed Teacher	279	16	2	6	--	303*
Regular Teacher	80	74	--	74	--	228
Paraprofessional	53	--	--	--	--	53*
Reading Specialist	--	--	--	--	--	--
Other Classroom Staff	--	--	--	--	--	--
CONSUMABLES						
Comp-Ed Books and AV Software	16	--	--	--	--	16**
Regular Books and AV Software	7	--	--	--	--	7
EQUIPMENT						
Comp-Ed AV Equipment	--	--	--	--	--	--
Other Comp-Ed Instructional Equipment	28	--	--	--	--	28**
Regular AV Equipment	--	--	--	--	--	--
Other Instructional Equipment	3	--	--	--	--	3
Comp-Ed Administration Equipment	--	--	--	--	--	--
MISCELLANEOUS						
Miscellaneous Comp-Ed Training Expenses	--	--	25	--	--	25**
Miscellaneous Comp-Ed Administrative Expenses	--	--	--	--	3	3**
FUNCTION TOTAL	466	127	27	80	3	703
PERCENT OF TOTAL COST	66.3	18.1	3.8	11.4	0.4	100.0

* All or part of these totals provided from Comp-Ed Budget
**All of these totals provided from Comp-Ed Budget

24

needed for the program of interest regardless of the specific funding source for any of the individual resources. Thus the $703 figure in this slide includes monies provided from local taxes, from state programs, from the Title I budget, and any other fund source which provided the resources actually allocated to the particular program studied.

* This next slide (SLIDE 8) shows the scope of this study in terms of the number of programs included, both for the 1973-74 study whose results are discussed here and for the 1974-75 study whose results are yet to be released for public discussion. Note the reference again to "Chapter 3" programs. The Chapter 3 program is Michigan's state funded performance pact with local districts whereby subsequent funding levels were pegged to program success. A specific portion of the program included in the cost-effectiveness model development were Chapter 3 programs, with the bulk of the programs studied being Title I programs.

In each of the 48 sites included in the 1973-74 study (and likewise for the 96 sites of the 1974-75 study) data on program operations were obtained from a number of levels of respondents

* in a number of specific program areas. This next slide (SLIDE 9) shows the specific respondents included and the specific areas of data provided by each type of respondent. As indicated, not all respondents were asked to provide data in all areas. Only the specific areas felt to reflect the responsibilities and activities of each type of respondent were included in the instrument designed and used for that respondent.

SLIDE 6

1973-74 SAMPLE (1974-75)

	HIGH ACHIEVING	LOW ACHIEVING	TOTAL
TITLE I	18 (36)	17 (34)	35 (72)
CHAPTER 3	7 (14)	6 (10)	13 (24)
TOTAL	25 (50)	23 (46)	48 (96)

DATA GROUP	PERSONNEL INTERVIEWED				
	DISTRICTWIDE COMP-ED DIRECTOR	PRINCIPAL	COMP-ED TEACHER	REGULAR TEACHER	PARA-PROFESSIONAL
A. Staff Variables	X	X	X	X	X
B. Organization and Management of Overall Program	X	X	X	X	X
C. Organization and Management of Classroom Reading Activities	N/A	N/A	X	X	N/A
D. [illegible] of Instruction	N/A	X	X	X	X
E.		X	X	X	X
I				X	N/A
G.				X	X
H.				X	X
I.				X	N/A
				9	6

SL1DE9

27

VERDY Transparency Frame Visual No._____ Subject _____

* This next slide (SLIDE 10) summarizes the data analysis and overall results of the 1973-74 study. The individual variables which discriminated between high achieving and low achieving programs and the program cost results will now be presented in further detail.

The effectiveness results are presented according to the person or groups of persons who are the main focus of the result. This next

* slide (SLIDE 11) details the results related to the activities of the district's comp ed director and to the school's principal. In each case the specific wording of the individual variable result means that more of the factor listed was significantly associated with the success of the program.

* This next slide (SLIDE 12) details the results related to the specially hired comp ed teacher involved in the program studied.

* Next are shown (SLIDE 13) the results related to the regular classroom teacher who may also provide a sizeable portion of the reading program for comp ed students in the buildings studied.

* The next slide (SLIDE 14) details the results related to, first, paraprofessionals and, second, to non-comp ed reading specialists. The latter of these are reading specialists hired from non-comp ed funds -- usually either local funds or perhaps, a state funded reading program which is not focused solely upon comp ed students. The first result presented for paraprofessionals has been noted with great interest by many reviewers. This result simply states that the successful programs relied upon para-professionals less frequently than did the unsuccessful ones, and

SLIDE 10

SUBSEQUENT DATA ANALYSIS

- 45 INDIVIDUAL VARIABLES DISCRIMINATED
  --- "HIGHS" AND "LOWS"
- 17 OF 45 CONTRASTED FOR TWO-YEAR PERIOD
- TURNKEY REGRESSION ANALYSIS INDICATED IMPACT OF THE COST

SLIDE 11

SUMMARY RESULTS TO DATE - EFFECTIVENESS

- DISTRICT COMP ED DIRECTOR
  - % TIME PLANNING PROGRAM
  - % TIME INVOLVED IN TRAINING FOR PROGRAM
- PRINCIPAL
  - SATISFACTION WITH COMP ED CURRICULUM DECISION IN SCHOOL
  - SATISFACTION WITH DEGREE OF READING ACTIVITY COORDINATION IN SCHOOL
  - EFFECTIVENESS OF PROGRAM SUPPORT AS VIEWED BY REGULAR TEACHERS

SLIDE 12

- COMP ED TEACHER
  - FRACTION OF MATERIALS SELECTED BY
  - DAYS OF TRAINING PROVIDED AT OUTSET OF PROGRAM
  - WHETHER INVOLVED IN SELECTION/DEVELOPMENT OF PROGRAM'S PERFORMANCE OBJECTIVES
  - MORALE

SLIDE 13

- REGULAR TEACHER
  - SEMESTER HOURS IN READING DIAGNOSIS
  - FRACTION OF MATERIALS SELECTED BY
  - % NON-TEACHING TIME ON COMP ED DECISIONS
  - % NON-TEACHING TIME DEVOTED TO PLANNING, TRAINING, DECISION-MAKING, OR ADMINISTRATION SPECIFICALLY
  - EFFECTIVENESS OF 1973-74 TRAINING
  - MORALE

SLIDE 14

- PARAPROFESSIONALS
  - IF NOT PART OF PROGRAM
  - IF PART OF PROGRAM, WHETHER FULL TIME
- NON-COMP ED READING SPECIALIST
  - NUMBER OF VISITS TO REGULAR TEACHERS' CLASSROOMS TO OBSERVE COMP ED READING ACTIVITIES
  - EFFECTIVENESS OF PROGRAM SUPPORT AS VIEWED BY REGULAR TEACHERS

significantly so. This result says nothing at all about specific effective uses of paraprofessionals where they are used. Paraprofessional contribution to the success of these kinds of program is an area being studied in much greater detail in the 1974-75 study year. The results from this later year of effort may shed additional light on this controversial finding.

* This next slide (SLIDE 15) details the results of the 1973-74 study year related to comp ed students and their parents.

The results of the cost analysis for the 1973-74 study year
* are summarized next (SLIDE 16). These basic results imply that differences in allocation patterns (perhaps reflecting differences in priorities) may be more critical in determining program success than differences in the amount of funds available for all programs.

* This next slide (SLIDE 17) summarizes the reading achievement and program cost results for the 48 programs studied during the 1973-74 school year. Differences in program costs are indeed reflected in differences in achievement levels.

Contrasts of program differences between Chapter 3 programs and Title I programs studied are shown in the next two slides.
* First (SLIDE 18), program cost differences are displayed which indicate that the Title I program studied are significantly more
* costly than similarly sucessful Chapter 3 programs. Next (SLIDE 19), however, these cost differences between Chapter 3 and Title I programs are <u>not</u> reflected by significant differences in achievement results between similarly successful program groupings.

SLIDE 15

- COMP ED STUDENTS
  - DEGREE TO WHICH THEY LIKE SCHOOL, AS VIEWED BY COMP ED TEACHERS
  - DEGREE TO WHICH MATERIALS ARE MATCHED TO THEIR ABILITIES
- COMP ED PARENTS
  - EXTENT OF ASSISTANCE PROVIDED WHEN ASKED

SLIDE 16

SUMMARY RESULTS TO DATE - COST

- COST OF RESOURCES ALLOCATED TO READING EXPLAINED 30% OF OBSERVED VARIANCE IN 1973-74 RESULTS
- NO DIFFERENCE IN BACKGROUND COST PER PUPIL

SL 10E 17

ACHIEVEMENT/COST RESULTS

1973-74 SCHOOL YEAR

SITES	ACHIEVEMENT RESULTS AVERAGE MONTH/MONTH GAIN	COST RESULTS AVERAGE COST/PUPIL
25 "HIGH"	1.66	$742
23 "LOW"	0.96	$587

ACHIEVEMENT RESULTS - 1973-74 SCHOOL YEAR

TITLE I vs. CHAPTER 3

SITES	AVERAGE MONTH/MONTH GAIN	
	TITLE I (NO. SITES)	CHAPTER 3 (NO. SITES)
"HIGH"	1.73 (18)	1.48 (7)
"LOW"	0.98 (17)	0.90 (6)
COMBINED	1.37 (35)	1.21 (13)

SLIDE 19

COST RESULTS - 1973-74 SCHOOL YEAR
TITLE I vs. CHAPTER 3

SITES	AVERAGE COST PER PUPIL	
	TITLE I (NO. SITES)	CHAPTER 3 (NO. SITES)
"HIGH"	$849 (18)	$466 (7)
"LOW"	$669 (17)	$356 (6)
COMBINED	$762 (35)	$415 (13)

None of the Title I/Chapter 3 achievement contrasts indicated in thisslide are significant.

Before closing this portion of the presentation, a few cautions are suggested (SLIDE 20). MDE procedures and priorities may have caused some results to overly reflect Michigan specific factors. Further, specific considerations of these 1973-74 study year results should reflect the fact that these results are preliminary and subject to cross-validation in the 1974-75 study effort whose results have not yet been publically released.

Given these cautions, however, a number of policy implications are plausible (SLIDE 21). The techniques developed in this effort are very promising for wider applications at the state or local level / and for programs other than those solely in the comp ed area. Further, the results indicated here (and as modified by the cross-validation study) may well provide a rich basis for modifying Title I regulations and other program guidelines at the federal, state, or local level in a manner which indicates program improvement.

Overall, a number of areas appear quite promising for further study, experimentation, and/or dissemination. The list includes, but is not limited to, contingency funding, participatory management of education programs, and the delegation of decision-making powers to the lowest feasible level of the program's structure.

At this time, the formal portion of this presentation is completed. Thank you for this opportunity to discuss with you an area of analysis which we feel holds some promise for identifying specific avenues for improving educational programs.

SLIDE 2

CAUTIONS IN INTERPRETATION

- GENERALIZABILITY
  - MDE PROCEDURES
  - MDE PRIORITIES
- PRELIMINARY FINDINGS EXPLORATORY
  - FIRM UP HYPOTHESIS
  - CROSS VALIDATION WITHIN STATE

SLIDE 21

POLICY IMPLICATIONS

- IDENTIFIED TECHNIQUES
  - SEA-WIDE EVALUATION
  - PROGRAM IMPROVEMENT
    - NEW TITLE I REGULATIONS
    - OTHER
- SUGGEST POLICY VARIABLES FOR STUDY
  - CONTINGENCY-BASED FUNDING
  - PARTICIPATORY MANAGEMENT
  - DELEGATION OF DECISION-MAKING